

Effect of dementia prevention using VR technology, proved with QEEG!

Dong-A University, Professor Hyuntae Park's team(Department of Health Management) proved non-pharmacological training intervention program using iMediSync AI-Brain mapping technology!

Purpose

The most promising non-pharmacological interventions for delaying the progression of MCI to dementia are exercise and cognitive training.

Recently, virtual reality (VR) has also been explored for the treatment and prevention of dementia.

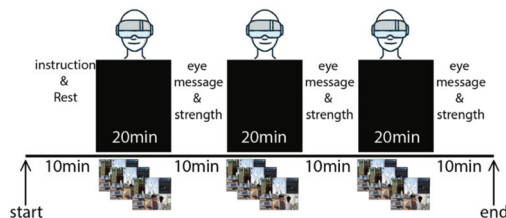
According to a recent report, VR training showed significant improvements in cognitive as well as physical function, and VR training was more favored than physical exercise by the elderly. This study was conducted through QEEG analysis to figure the difference of MCI elderly's cognitive function according to with or without VR intervention treatment.

*Virtual reality (VR): VR is a computer-simulated environment, closely resembling real-life situations and scenarios, which provides the user with the sensation of physically 'being there'.

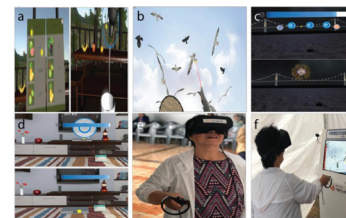
Subjects / Methods

68 MCI patients (16 Male, 52 Female / Average age 72.5) were allocated to either the VR-intervention group, n = 34, or control group, n = 34 (Afterwards, 1 dropout for each group). Outcome comparison was done with QEEG analysis, using AI-QEEG analyzing solution 'iSyncBrain'.

[VR Training Protocol]



[VR Training Contents]

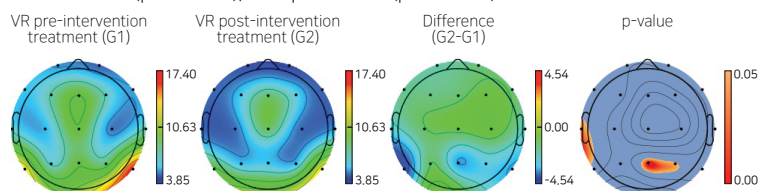


Results

[Topomap (Abs. power) – Decrease of theta waves]

Theta waves are related to degenerative brain diseases such as MCI and Alzheimer's disease dementia, so the result is significantly meaningful that after VR intervention treatment, theta waves decreased.

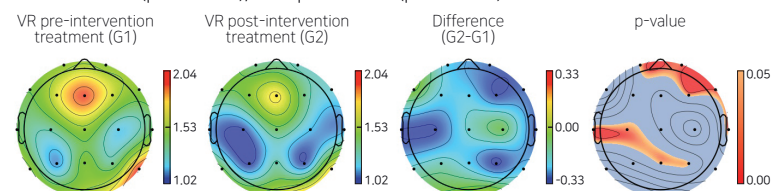
Parietal lobe (p = 0.013), Temporal lobe (p = 0.036)



[Theta/Beta Ratio (TBR) – Decrease of theta waves and increase of beta waves]

High TBR is related to decreased attention, so the result is significantly meaningful that after VR intervention treatment, beta waves increased and theta waves decreased, and this led to the decrease of TBR.

Parietal lobe (p = 0.027), Temporal lobe (p = 0.035)



Discussion

- MCI patients are increasing rapidly, but it is difficult to find a dementia prevention and treatment program.

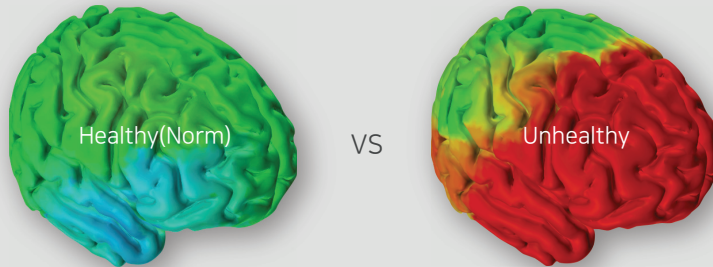
To overcome this, VR intervention treatment was conducted to provide the user with the sensation of physically 'being there'.

- Significant results were shown in this study, compared to VR pre-intervention treatment, in VR post-intervention treatment, theta waves decreased, and beta waves increased.

- 'iSyncBrain' QEEG solution visually shows these differences, and it is expected to be used as a screening tool before and after the intervention treatment.

Normative Comparison

Comparison with Normative Database Group



Powerful group statistical analysis
utilizing normative library
The world's one and only age and sex
specific normative database

Independent t-test (G1 vs G2)

Used for comparison between
two independent groups



Paired t-test (Pre vs Post)

Pre-post comparison
within a group



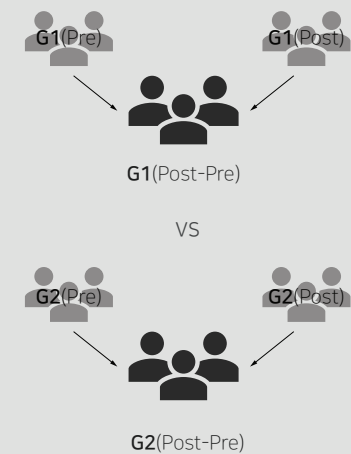
ANOVA (3-Group)

Comparisons among three
independent groups



2-Group (Two arm study)

Comparison between two groups
using each group's pre-post differences



1 : 1 Comparison

Pre and post comparison
for an individual

